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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/085,193	02/27/2002	Robert E. Buxbaum	REB-12403/01	3536
7590	08/09/2005		EXAMINER	
Gifford, Krass, Groh, Sprinkle, Anderson & Citkowski, P.C. Suite 400 280 N. Old Woodward Avenue Birmingham, MI 48009-5394			DUONG, THANH P	
		ART UNIT	PAPER NUMBER	
		1764		
DATE MAILED: 08/09/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/085,193	BUXBAUM, ROBERT E.
	Examiner	Art Unit
	Tom P. Duong	1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.  
 If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.  
 If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.  
 Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 23 May 2005.  
 2a) This action is FINAL.                            2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1-38 is/are pending in the application.  
 4a) Of the above claim(s) 1-14, 16-19, 23, 24 and 26-28 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 15, 20-22, 25 and 29-38 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
     1. Certified copies of the priority documents have been received.  
     2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
     3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
 \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
     Paper No(s)/Mail Date 8/1/02.

4) Interview Summary (PTO-413)  
     Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of Species V (Claims 15, 20-22, and 25) in the reply filed on 5/23/05 is acknowledged.

### ***Claim Objections***

Claim 15 is objected to because of the following informalities:

In claim 15, line 1, "claim 1" should be replaced with --claim 29--.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claim 29 and 38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 38 recites the limitation "heated material" in line 1. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buxbaum (5,931,987). Note, the gas purification system is being examined as an apparatus. Buxbaum discloses a gas purification system (Figs.1A-3A) comprising: a reactor (5) operating above room temperature having a reactor volume and a reactor wall 12" having an interior side and an exterior side, and defining a communicating portal therebetween for a mixed gas flow; a gas selective membrane (14) within the reactor volume, said gas membrane in contact with the mixed gas flow and selectively passing a constituent gas of the mixed gas flow therethrough, such that a raffinate (Col. 9, lines 18-23) of the mixed gas flow is retained in contact with said membrane; an outlet channel (46", 26") for removing said raffinate from contact with said selective membrane, and a passageway (Col. 4, lines 37-40) for the removal of the constituent gas from the interior of said reactor. With respect to the raffinate compressor disposed in fluid communication with said outlet channel, it is conventional to provide a compressor or venture means in the gas purification system and it would have been obvious to do so here to facilitate the removal and/or purging the raffinate from the membrane.

3. Claims 22 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buxbaum '987 in view of La Pierre et al. (6,348,278). Regarding claim 22, Buxbaum fails to disclose the fuel cell is powered by the constituent gas. LaPierre

teaches the constituent gas (purified hydrogen via line 40) is supplied to the fuel cell (52) to generate electricity (Fig. 2). Thus, it would have been obvious in view of LaPierre to one having ordinary skill in the art to modify the system of Buxbaum with a fuel cell powered by the gas constituent as taught by LaPierre in order to generate electricity. Regarding claim 25, Buxbaum fails to disclose a raffinate burner. LaPierre teaches a portion of the raffinate (via line 48) is fed to the raffinate burner (94) to combust the gas and generate heat for the vaporizer and the reforming reaction (Col. 10, lines 26-35). Thus, it would have been obvious in view of LaPierre to one having ordinary skill in the art to modify the system of Buxbaum with a raffinate burner as taught by LaPierre in order to generate heat for the vaporizer and the reformer.

4. Claims 15 and 29-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buxbaum '987 in view of Prasad et al. (5,888,272) and LaPierre et al. '278. Regarding claims 29, 33, 35, and 37, Buxbaum discloses a reactor-purifier system (Figs.1A-3A) for generated purified hydrogen and a raffinate stream from a feed, the feed provided by said feed. Buxbaum fails to disclose a burner for combusting the raffinate produced by said reactor-purifier system to yield a heated exhaust gas, heat from said burner being used to heat said reactor-purifier system and a source of air mixed with said raffinate before combustion in said burner. Prasad teaches the raffinate (via line 10) from the reactor-purifier system (35), air stream (12), and fuel stream (11) is fed to the burner (combustor 14) to produce a gas stream 17, which is used to purge the reactor-purifier system (ion transport membrane 35). Thus, it would have been obvious

in view of Prasad to one having ordinary skill in the art to modify the system of Buxbaum '987 with a burner and air stream as taught by Prasad in order to create an exhaust gas stream to facilitate in purging the reactor-purifier system. With respect to the feed pump and back pressure regulator, it is conventional to provide a feed and back pressure regulator to the gas purification and it would have been obvious to do so here to provide a means for feeding or transport the mixed gas to the reactor-purified system and to control the amount of raffinate to the burner. Regarding claim 15, it is conventional to provide a compression mean such as a compressor upstream of the membrane reactor and it would have been obvious to do so here to compress and elevate the mixed gas to a higher pressure prior feeding to the membrane reactor for optimum mixed gas separation. Regarding claims 30-31, 34, and 36, it is conventional to provide auxiliary control means and sensors in the purification system and it would have been obvious in view to do so here to provide proper flow rate ratio to the burner to increase the efficiency of the system. Regarding claim 32, LaPierre teaches the constituent gas (purified hydrogen via line 40) is supplied to the fuel cell (52) to generate electricity (Fig. 2). Thus, it would have been obvious in view of LaPierre to one having ordinary skill in the art to modify the system of Buxbaum with a fuel cell powered by the gas constituent as taught by LaPierre in order to generate electricity. Regarding claim 38, Buxbaum '987 discloses (best understood by Examiner) the heated material (cartridge heater 48).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom P. Duong whose telephone number is (571) 272-2794. The examiner can normally be reached on 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tom Duong  
August 01, 2005  
TD *TD*

  
Glenn Caldarola  
Supervisory Patent Examiner  
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